

Corporoplasty for induratio penis plastica with soft axial tutors, single relaxing albugineal incision and safenous grafting. A 3-year follow up

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Summary

Objectives: Etiological and pathogenic mechanisms of Peyronie's disease (PPI) are today better known than in the past, but till now therapeutic options are not completely satisfactory. In fact several therapeutic alternatives were suggested, but none demonstrated its superiority. Surgery is the preferred option in chronic stable disease with the following goals: penile straightening, penile lengthening and recovery of penetrative coital activity. Aim of this paper was to present a personal experience with modifications of the original surgical technique.

Materials and Methods: From September 2005 to December 2008, a total of 58 patients (mean age 44.7 years) underwent corrective penile surgery for PPI. All patients had a single plaque with dimensions ranging 1.2-2.6 cm in length. Simple dorsal recurvatum > 50° was observed in 38 patients, dorsolateral left recurvatum > 45° in 8, ventral recurvatum > 40° in 6, lateral left recurvatum > 45° in 4, dorsolateral right recurvatum > 45° in 2. Forty patients were implanted with a 7 F Virilis II prosthesis, 7 with a 7 F Virilis I, 8 with 10 F Virilis I and 3 with 9.5 F SSSA prosthesis. Implanted tutor length ranged between 16.6 and 20 cm, measuring from crura to corpora apex. In 46 patients we implanted a safena graft and in 12 with recurvatum > 60° we used bovine pericardial collagen patch (Veritas - Hydrix).

Results: At long term follow up (1-3 years) we observed a penile elongation from 1.2 to 2.3 cm with complete correction of penile recurvatum in all the patients. After 12-36 months excellent penetrative sexual activity was referred by 75% of the patients, satisfactory in 20% and disappointing in 5%. Major complaints were "cool glans" feeling, delayed ejaculation, unnatural penis appearance due to permanent hyperextension. None developed lower urinary tract symptoms. **Conclusions:** According to such results, the described technique should be considered as a gold standard for all cases of PPI associated to recurvatum > 35-40° (lateral, ventral and dorsal) associated to a plaque with mild-moderate erectile dysfunction.

KEY WORDS: Recurvatum; Peyronie's disease; Venous graft; Penile prosthesis.

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INTRODUCTION

About 0.3-2% of men are affected by Peyronie's disease (PPI), involving relevant physical and psychological problems (1). Medical therapy has the only role to try to slow down or to stop the development of fibrous plaques, from the first clinical acute inflammatory phase to the chronic fibrotic evolution of the sub albugineal fascia. PPI has an irregular but slow clinic evolution, alternating acute episodes ("pousseè") to apparent relief. Medical therapy is recommended in patients in the early phase of the illness

characterized by unstable progressive plaque and painful erections or in patients refusing surgery or with concomitant clinical contraindications.

However shared protocols for conservative therapy of PPI are completely lacking and no standardized therapy is defined.

Clinically we can recognize two separate phases of illness: active (clinical duration of about 12-18 months, accompanied with painful erections and sometimes asso-

ciated to recurvatum) and chronic (frequent erectile dysfunction, presence of recurvatum, progressive shortening of the penis length, rarely evolving to a micropenis). The main pathological characteristic of the chronic disease is the plaque. Surgery is the preferred option in chronic stable disease, by which we try to reach the following goals: penile straightening, penile lengthening, recovery of penetrative coital activity.

Several surgical options are proposed for PPI correction. Plaque surgery is preferred in case of stabilized disease, solitary plaque non involving erectile structure and good erectile rigidity.

Techniques for recurvatum correction with albuginea shortening (Nesbit or Yachia procedure) (2, 3) are considered as "minimal" surgical procedures, but cosmetic results are often unsatisfactory. Reduction of penis length is proportional to the recurvatum degree and can be calculated measuring the difference between the longest and the shortest curve of the penis in complete erection. These techniques are widely used because are easy to perform and usually are reserved to patients with lateral or ventral recurvatum not over 35/40° and with sufficient length of the penis or to aged patients with co-morbidity that are not suitable for more complex surgery in order to avoid major complications (4).

A possible advantage related to such corporoplasties is related to the possible diminution of corpora cavernosa volume, as consequence of penis shortening, that sometimes is followed by improved sexual performance.

Excision techniques are abandoned by now due to well known functional sequelae (5), a relaxing incision is preferred with an autologous graft or eterologous patch (6-8). Between several techniques, Paulo Egydio's geometrical corporoplasty (9) followed by the implant of a collagen pericardial bovine patch represents a complicated procedure, because it needs accurate measurements of the erected penis to evaluate an adequate tailoring of the patch. Erection is obtained by PGE 1 intracavernous injection, as preferable alternative to the usual hydraulic maneuver. On the other hand this kind of erection can modify the linear forces of the penis sometimes causing inadequate measuring of the size of the patch.

Plaque surgery can be associated to prosthesis implant. For patients with recurvatum and severe erectile dysfunction (ED) inflatable prosthesis can be implanted after plaque incision and heterologous patch grafting or after simple plaque incision (Wilson's maneuver without cavernous grafting) (10-13).

In patients with recurvatum associated with mild-moderate erectile dysfunction the surgical positioning of small caliber soft axial penile tutors, associated to plaque incision and saphenous autologous grafting is preferable. In particular, Austoni's surgical technique was widely popularized in Italy and now is often adopted in several Italian andro-urological departments. Aim of this paper was to present our personal experience with modifications of the original Austoni's surgical technique (8).

SURGICAL TECHNIQUE

The main steps of the original surgical procedure were: mini-invasive implant of soft axial penile prosthesis (9-

Figure 1.

Incisione inguinale per il prelievo di safena alla cross.



Figure 2.

Grafting di safena prelevato alla cross.



Figure 3.

Graft safenico adattato alla tonaca albuginea. Perfetta congruità del graft safenico al difetto di sostanza dopo incisione di placca.



10 mm in caliber) 2 cm longer than corpora cavernosa to make more evident the recurvatum location; single-step corpora cavernosa calibration by 10 F Hegar dilator in order to spare as much possible of cavernous tissue; relaxing incision of tonaca albuginea on the guide of the soft prosthetic support to save the erectile tissue (inci-

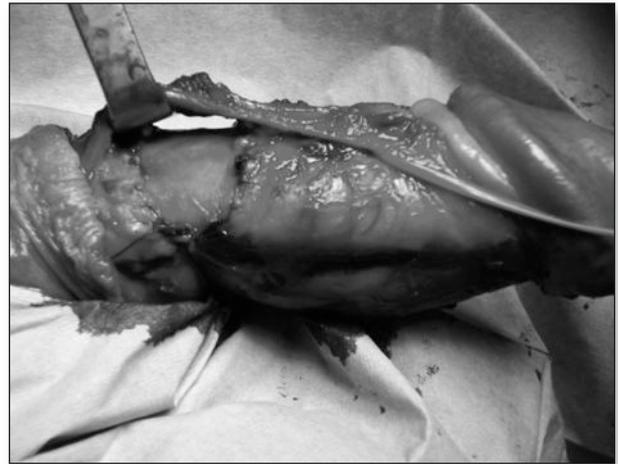
Figure 4.

Fase dell'anastomosi del graft safenico alla tonaca albuginea.



Figure 5.

Graft di safena anastomizzato alla tonaca albuginea.



sion should create a para urethral acute angle lozenge, having the main extension on the concavity of albuginea); covering of the lozenge with saphenous graft taken at the cross (a very small graft can cover a wide albuginea defect, thanks the elastic characteristic of the vein patch); saphenous-albuginea suturing by 3/0 monothread running suture; circumcision performed at the end of surgery; positioning of a vacuum sub dartoic drainage; restraining non-compressive bandage to allow serum and blood discharge and promote nocturnal erections.

Compared with this classical surgical technique the following modifications were adopted in the present series:

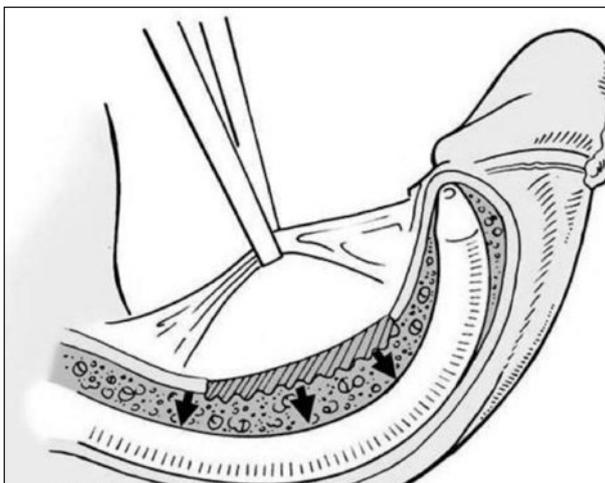
- 1) use of smaller 7 F soft axial implant with different rigidity aiming to spare as much as possible the surrounding erectile tissue, to promote easy penetration and to hide as more as possible the presence of the prosthesis;

- 2) reduction of implant length limiting at no more than 1 cm over corpus cavernosum length in order to prevent tension that can cause alterations in vascular supply and the risk of necrosis especially to the glans (in consideration to the often difficult and incomplete dissection of the vascular nervous bundle that in PPI patients is often involved in albuginea fibrosis) and to avoid a permanent erection of the penis;
- 3) plaque excision by a 11 blade scalpel with magnification loops to optimize the sparing of erectile tissue;
- 4) in case of recurvatum over 60 degrees use of bovine pericardium collagen patch, instead of saphenous autologous graft (in consideration that severe curvature may need wider lozenges, not so easy to cover with a single saphenous graft).

Figure 6.

Incisione della tonaca albuginea nel punto di massima curvatura. Tutore di 1 cm almeno più lungo del cc per evidenziare il recurvatum

(gentile concessione Prof. E. Austoni by Atlas of reconstructive penile surgery).

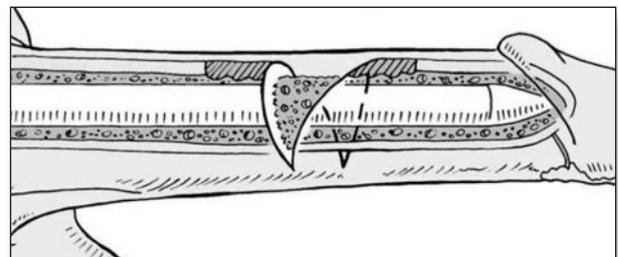


The patch in use (Hydrix) presents peculiar characteristics of handling and softness. Only 72 hours after positioning, the patch is inoculated in the host tissues and after three months it is not possible to distinguish it from the original albuginea fascia.

The described technique can be used in different types of recurvatum: dorsal, dorsolateral in right or left side, lateral and ventral. In the case of pure lateral recurvatum the length of the two tutors has to be the same for each

Figure 7.

Allungamento dell'asta dopo incisione di rilassamento della placca (Gentile concessione Prof. E. Austoni by Atlas of reconstructive penile surgery, Pacini Editore).



corpus cavernosum; dissection of the bundle must be very careful from a para-urethral incision of Buck's fascia in the curvature site to the lateral side of the opposite corpus; urethra has to be isolated from the plate in the side of recurvatum; albuginea incision must be performed involving the corpus cavernosum affected by recurvatum on both dorsal and ventral side in a semicircular shape from 12 to 6 o'clock to allow an adequate positioning of the patch or graft with complete correction of lateral recurvatum. Ventral recurvatum is the more complex condition requiring an accurate dissection of the bundle and mobilization of the urethra in the site of recurvatum. A wide bundle dissection in the opposite side of recurvatum is suggested in order to permit a mild hypercorrection of the recurvatum. A meticulous dissection of the urethra from the ventral plate of corpora cavernosa is required to avoid excessive manipulations and risk of devascularization of the glans and damage of the urethral blood supply.

MATERIALS AND METHODS

From September 2005 to December 2008, a total of 58 patients (mean age 44.7 years) underwent corrective penile surgery by the previously described surgical technique.

Sexual activity was completely preserved in only 12 patients who presented several risk factors for erectile dysfunction, as hypertension in pharmacological treatment and severe hypercholesterolemia. Six of them were strong smokers. The remaining 46 patients were affected by mild or moderate erectile dysfunction. Six of them had diabetes in oral therapy, although in good metabolic control.

Pre-operative examination included: penile dynamic echo color Doppler, photographic evaluation of penile recurvatum, penile dynamic magnetic resonance (10 patients), serum free and total PSA, uroflowmetry, renal and bladder sonography, IIEF 5 questionnaire, SEP2 and SEP3. Psychosexual evaluation was also performed to investigate possible couple problems.

All patients had a single plaque with dimensions ranging 1.2-2.6 cm in length.

Simple dorsal recurvatum $> 50^\circ$ was observed in 38 patients, dorsolateral left recurvatum $> 45^\circ$ in 8, ventral recurvatum $> 40^\circ$ in 6, lateral left recurvatum $> 45^\circ$ in 4, dorsolateral right recurvatum $> 45^\circ$ in 2.

In all patients preliminary subcoronal degloving was performed and 6 patients had scrotal peri penile incision. Forty patients were implanted with 7 F Virilis II prosthesis, 7 with a 7 F Virilis I, 8 with 10 F Virilis I and 3 with 9.5 F SSSA prosthesis. Implanted prosthesis length ranged between 16.6 and 20 cm, measuring from crura to corpora apex. In 46 patients we implanted a saphenous graft and in 12 with recurvatum $> 60^\circ$ we used bovine pericardial collagen patch (Veritas - Hydrix).

All patients had erectile rehabilitation with iPDE5 from postoperative 15th day with the aim of optimize distal erectile tissue vascularization.

Post operative follow up evaluation was achieved after 15, 30, 60 and 90 days and after 4, 8, 12, 16, 24 and 36 months by IIEF 5, SEP2 and SEP3 administration.

RESULTS

At long term follow up (1-3 years) we observed a penile elongation from 1.2 to 2.3 cm with complete correction of penile recurvatum in all the patients.

Recovery of penetrative sexual activity was achieved after 60 days in 31 patients, after 90 days in 11 and after 120 days in 6. After 4 months penetrative sexual activity was considered satisfactory in 65% of the patients, but disappointing in 35% of cases; after 8 months was considered satisfactory in 75%, and rather satisfactory in 25%; after 12-36 months excellent penetrative sexual activity was referred by 75% of the patients, satisfactory in 20% and disappointing in 5%. Major complaint were "cool glans" feeling, delayed ejaculation, unnatural penis appearance due to permanent hyperextension. Eight patients reported use of iPDE5, 3-5 times monthly, to achieve a better erectile performance. Twenty-five percent of patients reported usual sexual intercourse with more than a partner and 15% started a new steady relationship with a new partner after marriage separation after 2 years from surgery. None developed lower urinary tract symptoms.

DISCUSSION

The reported results suggest several considerations: respect to the original operative technique the use of small caliber implants ensured a differentiated rigidity and resulted more respectful of the residual cavernous tissue; at 2 months the pseudo-capsule surrounding small caliber implants involved less scarring of the surrounding erectile tissue; use of iPDE5 is mandatory in the 2 months after surgery in order to enhance cavernous endothelial healing and stabilization during the period in which the fibrous pseudo-capsula is developing.

We suggest a measurement of the implant length in order to not exceed cavernous length itself. A difference of 1 cm can be enough to make evident the recurvatum. Longer implants did not obtain an increase of penile length because all the albuginea is often involved in illness that may cause a penile shortening. The neurovascular bundle is often involved in albuginea fibrosis and its dissection is often incomplete and troublesome: an excess of dissection and pulling of the bundle may cause alteration in gland vascularization until necrosis.

Recently Austoni et al propose to implant tutors longer than cavernous corpus, 1 cm more for every 30° of curvature. However an excessive tutor length causes steady erection or semi-erection of the penis, not respecting the original objectives of the technique, which require only an hyperextension of the penis in order to allow an acute angle positioning during erection and make easy penetration. A small percentage of patients referred a "genital discomfort" relative to penis hyperextension, considered difficult to hide. In severe recurvatum (more than 50°) is preferable, as alternative to saphenous autologous graft that is often insufficient to an adequate covering of a wide lozenge, to use a bovine pericardial collagen patch with good biocompatibility and flexibility that makes it easier to apply. Complete albuginea tissue absorption is usually very quick and we did not observe scarring after implantation. Furthermore surgical time is reduced and possible complications related to venous excision are avoided.

CONCLUSIONS

The surgical technique described is considered a satisfactory option for PPI with recurvatum involving difficulty for penetrative sexual activity, in association or not to mild to moderate ED; it is a technique, quite easy to learn and to perform. The implantation of a support prosthesis preserves penile extension along time, in comparison to other techniques for recurvatum correction. Small soft implants are not really a true prosthesis, because erection is spontaneously obtained by the presence of the residual spared erectile tissue. No manipulation of the prosthesis is requested to achieve an erection, as necessary after implantation of a double or tri-component prosthesis or a semi rigid one.

Surgical alternatives are represented by geometric corporoplasty (Paulo Egydio technique) or hydraulic prosthesis implant associated or not to plaque surgical management. The first technique is difficult to learn and to be reserved to very experienced surgeons and in patients with good erectile performances. On the other hand hydraulic prosthesis implant associated to plaque surgery should be reserved to patients with PPI associated to severe ED. Not every patient, however, is psychologically inclined to a procedure involving a definitive modification that transforms erection to a totally artificial act. This aspect has to be carefully defined by psycho-sexual pre-operative counseling, that is mandatory for all patients committed to an andrologic surgical procedure to correct PPI.

Patient worries and expectancies are usually focalized on the resolution of recurvatum, that is the most important clinical symptom of the pathology. Often patient underestimate erectile function problems, that are so frequently associated to PPI in relation to veno-occlusive dysfunction correlated to the fibrosis of albuginea.

According to such results and considerations, together with the easy learning of the technique, the described technique should be considered as a gold standard for all cases of PPI associated to recurvatum > 35-40° (lateral, ventral and dorsal) associated to a plaque with mild-moderate erectile dysfunction.

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